California's Sea Level Rise Guidance Document

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Guidance Framework

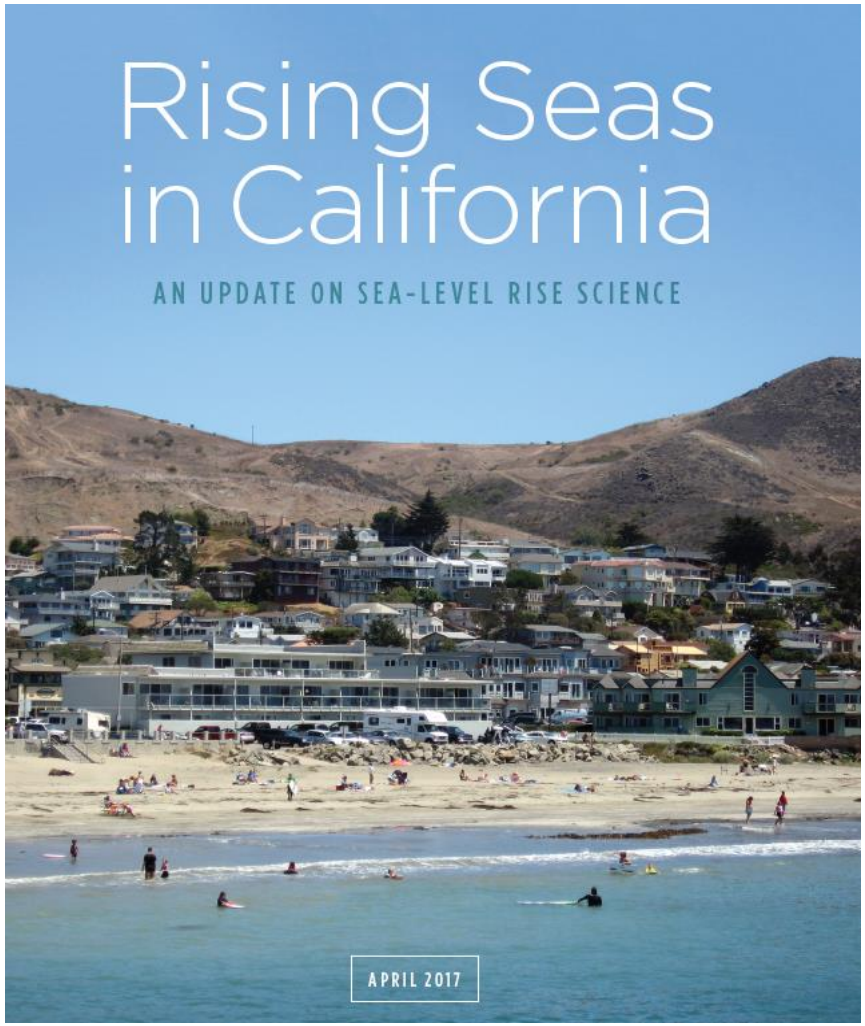
- Best available science
- Guidance on how to select projections
- Recommendations for planning and adaptation

Policy Context and Audience

- Governor Brown's Executive Order B-30-15: state agencies must factor climate change into planning and investment decisions;
- Senate Bill 379 (Jackson) local governments must incorporate adaptation and resiliency strategies into General Plans;
- Senate Bill 264 (Wieckowski) established ICARP to coordinate local and state climate adaptation strategies.

Flooding of East Cliff Drive, Moran Lake, Santa Cruz County, January 20, 2010 King Tide (Photo credit: Dave Revell)

Best Available Science



- *Probabilistic projections* tied to a range of emissions scenarios
- *H++ Scenario* of extreme sea level rise, resulting from melting West Antarctic ice sheet under high emissions trajectory

Extended Stakeholder Engagement

Interviews and listening sessions with state agencies, local governments and community members

Science summary presented to the OPC; OPC resolution adopted

Public workshops to solicit feedback on a draft framework

30 day public comment period on draft *State Sea-level Rise Guidance Document:* ends December 15, 2017

Approval by the OPC of the final *State Sea Level Rise Guidance Document:* pending January 31, 2018 OPC Council Meeting

Risk Analysis and Decision Framework

Step 1:
Identify the nearest tide gauge

Step 2:
Evaluate project lifespan

Step 3:
Identify a range of SLR projections

Step 4:
Evaluate potential impacts and adaptive capacity across range of SLR projections and emissions scenarios

Step 5:
Select SLR projections based on risk tolerance

TABLE 1: Projected Sea-Level Rise (in feet) for San Francisco

Probabilistic projections for the height of sea-level rise shown below, along with the H++ scenario (depicted in blue on the right-hand side), as seen in the Rising Seas Report. The H++ projection is a single scenario and does not have an associated likelihood of occurrence as do the probabilistic projections. Probabilistic projections are with respect to a baseline of the year 2000, or more specifically the average relative sea level over 1991 - 2009. High emissions represents RCP 8.5; low emissions represents RCP 2.6.

Recommended projections for use in low, medium-high and extreme risk aversion decisions are outlined in red boxes below.

		Probabilistic Projections (in feet) (based on Kopp et al. 2014)				H++ scenario (Sweet et al. 2017) *Single scenario
		Median *50% probability sea-level rise meets or exceeds…*	Likely range *67% probability sea-level rise is between…*	1-in-20 chance *5% probability sea-level rise meets or exceeds…*	1-in-200 chance *0.5% probability sea-level rise meets or exceeds…*	
			Low-risk Aversion		Medium - High risk Aversion	Extreme-risk Aversion
High emissions	2030	0.4	0.3 - 0.5	0.6	0.8	1.0
	2040	0.6	0.5 - 0.8	1.0	1.3	1.8
	2050	0.9	0.6 - 1.1	1.4	1.9	2.7
Low emissions	2060	1.0	0.6 - 1.3	1.6	2.4	
High emissions	2060	1.1	0.8 - 1.5	1.8	2.6	3.9
Low emissions	2070	1.1	0.8 - 1.5	1.9	3.1	
High emissions	2070	1.4	1.0 - 1.9	2.4	3.5	5.2
Low emissions	2080	1.3	0.9 - 1.8	2.3	3.9	
High emissions	2080	1.7	1.2 - 2.4	3.0	4.5	6.6
Low emissions	2090	1.4	1.0 - 2.1	2.8	4.7	
High emissions	2090	2.1	1.4 - 2.9	3.6	5.6	8.3
Low emissions	2100	1.6	1.0 - 2.4	3.2	5.7	
High emissions	2100	2.5	1.6 - 3.4	4.4	6.9	10.2
Low emissions	2110	1.7	1.2 - 2.5	3.4	6.3	
High emissions	2110	2.6	1.9 - 3.5	4.5	7.3	11.9
Low emissions	2120	1.9	1.2 - 2.8	3.9	7.4	
High emissions	2120	3	2.2 - 4.1	5.2	8.6	14.2
Low emissions	2130	2.1	1.3 - 3.1	4.4	8.5	
High emissions	2130	3.3	2.4 - 4.6	6.0	10.0	16.6
Low emissions	2140	2.2	1.3 - 3.4	4.9	9.7	
High emissions	2140	3.7	2.6 - 5.2	6.8	11.4	19.1
Low emissions	2150	2.4	1.3 - 3.8	5.5	11.0	
High emissions	2150	4.1	2.8 - 5.8	7.7	13.0	21.9

Evaluate Impacts and Adaptive Capacity Across Range of Projections and Emissions Scenarios

Tuluwat Village site, Humboldt Bay, 2010 King Tide
(Photo credit: Aldaron Laird)

- *Consequence of potential impacts*
- *What is at stake*
- *Adaptive capacity*
- *Economic impacts*

Risk Tolerance Analysis

Cardiff State Beach, November 25, 2015 King Tide
(Photo credit: Gabe Buhr)

Adaptation Strategies

Visualization Tools and Resources

NOAA

Surging Seas
Risk Finder

cal-adapt

The Nature Conservancy

State Adaptation
Clearinghouse

Discussion

- Reactions to the Guidance document
- Suggestions for public outreach after Guidance is adopted
- ICARP assistance

For more information and updates, visit:

http://www.opc.ca.gov/climate-change/updating-californias-sea-level-rise-guidance/

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